1. A sensor readout circuit which provides a frequency signal output, the readout circuit comprising:

a phase detector circuit responsive to an output signal from a sensor and an input signal to the sensor and configured to detect the phase difference between the input signal and the output signal; and

a drive circuit responsive to the phase detector circuit and configured to maintain a fixed phase difference between the input signal and the output signal.

2. The sensor readout circuit of claim 1 in which the fixed phase difference between the input signal and the output signal is maintained at zero degrees by the drive circuit.

3. The sensor readout circuit of claim 1 in which the fixed phase difference between the input signal and the output signal is maintained at 90° by the drive circuit.

4. The sensor readout circuit of claim 1 in which the fixed phase difference between the input signal and the output signal is maintained at 180° by the drive circuit.

5. The sensor readout circuit of claim 1 in which the fixed phase difference between the input signal and the output signal is maintained at 270° by the drive circuit.

6. The sensor readout circuit of claim 1 in which the fixed phase difference between the input signal and the output signal is maintained at a fixed phase difference between 0° and 360° by the drive circuit.

7. The sensor readout circuit of claim 1 further including a phase delay adjustment circuit responsive to the input signal and the phase detection circuit for adjusting the phase difference between the input signal and the output signal.

8. The sensor readout circuit of claim 1 in which the output signal is a sinusoidal voltage at a predetermined frequency.

9. The sensor readout circuit of claim 8 in which the predetermined frequency is in the range of 10 MHz to 30 MHz.

10. The sensor readout circuit of claim 8 further including a voltage step module configured to offset the input voltage by a predetermined amount to offset the frequency and measure the corresponding phase detector circuit output change.

11. The sensor readout circuit of claim 10 in which input voltage is offset 90°.

12. The sensor readout circuit of claim 10 in which input voltage is offset 180°.

13. The sensor readout circuit of claim 10 in which input voltage is offset 270°.

14. The circuit of claim 9 in which the Q is calculated from the ratio of the offset of the voltage and the offset of the frequency.

15. The sensor readout circuit of claim 1 in which the sensor is a flexure plate wave device.

16. The sensor readout circuit of claim 1 in which the sensor readout circuit continuously outputs a frequency representing the resonance frequency of the sensor.

17. A sensor readout circuit which provides a frequency signal output, the readout circuit comprising:

a phase detector circuit responsive to an output signal from a sensor and an input signal to the sensor and configured to detect the phase difference between the input signal and the output signal;

a drive circuit responsive to the phase detector circuit and configured to maintain a fixed phase difference between the input signal and the output signal; and

a phase delay adjustment circuit responsive to the input signal and the phase detection circuit for adjusting the phase difference.

18. A sensor readout circuit which provides a frequency signal output, the readout circuit comprising:

a phase detector circuit responsive to an output signal from a sensor and an input signal to the sensor and configured to detect the phase difference between the input signal and the output signal; and

a drive circuit responsive to the phase detector circuit and configured to maintain a fixed phase difference between the input signal and the output signal; and

a voltage step module configured to offset the voltage by a predetermined amount to offset the frequency and measure the corresponding phase detector circuit output change.

19. The circuit of claim 18 in which the Q is calculated from the ratio of the offset of the voltage and the offset of the frequency.

20. A sensor readout circuit which provides a frequency signal output, the readout circuit comprising:

a phase detector circuit responsive to an output signal from a sensor and an input signal to the sensor and configured to detect the phase difference between the input signal and the output signal;

a drive circuit responsive to the phase detector circuit and configured to maintain a fixed phase difference between the input signal and the output signal;

a phase delay adjustment circuit responsive to the input signal and the phase detection circuit for adjusting the phase difference; and

a voltage step module configured to offset the voltage by a predetermined amount to offset the frequency and measure the corresponding phase detector circuit output change.

21. A sensor readout circuit which provides a frequency signal output, the readout circuit comprising:

a phase detector circuit responsive to an output signal from a flexure plate wave device and an input signal to the flexure plate wave device and configured to detect the phase difference between the input signal and the output signal; and

a drive circuit responsive to the phase detector circuit and configured to maintain a fixed phase difference between the input signal and the output signal.

22. The sensor readout circuit of claim 21 in which the fixed phase difference between the input signal and the output signal is maintained at zero degrees by the drive circuit.

23. The sensor readout circuit of claim 21 in which the fixed phase difference between the input signal and the output signal is maintained at 90° by the drive circuit.

24. The sensor readout circuit of claim 21 in which the fixed phase difference between the input signal and the output signal is maintained at 180° by the drive circuit.

25. The sensor readout circuit of claim 21 in which the fixed phase difference between the input signal and the output signal is maintained at 270° by the drive circuit.

26. The sensor readout circuit of claim 21 in which the fixed phase difference between the input signal and the output signal is maintained at a fixed phase difference between 0° and 360° by the drive circuit.

27. The sensor readout circuit of claim 21 further including a phase delay adjustment circuit responsive to the input signal and the phase detection circuit for adjusting the phase difference.

28. The sensor readout circuit of claim 21 in which the output signal is a sinusoidal voltage at a predetermined frequency.

29. The circuit of claim 24 further including a voltage step module configured to offset the voltage by a predetermined amount to offset the frequency and measure the corresponding phase detector circuit output change.

30. The sensor readout circuit of claim 21 in which the sensor readout circuit continuously outputs a frequency representing the resonance frequency of the flexure plate wave device.

31. A method for determining the frequency signal output of a sensor, the method comprising the steps of:

detecting the phase difference between an output signal from a sensor and an input signal to a sensor; and

maintaining a fixed phase difference between the input signal and the output signal.

32. A method for determining the frequency signal output of a sensor, the method comprising:

detecting the phase difference between an output signal from a sensor and an input signal to a sensor;

maintaining a fixed phase difference between the input signal and the output signal; and

adjusting the phase difference between the input signal and the output signal to a predetermined fixed phase difference.